

ABSTRACT

A method for manufacturing a MOSFET equipped with a silicide layer over shallow source and drain junctions without leakage generation is provided. By restricting the temperature of manufacturing steps after the silicide formation below a critical temperature T_c , which is defined below as a function of a junction depth D_j from 20 nm to 60 nm, leakage generation is practically suppressed.

$$T_c = a \times D_j + b,$$

where $a = 6.11$ ($20 < D_j \leq 26$)
 $= 1.60$ ($26 < D_j \leq 60$),
 $b = 290.74$ ($20 < D_j \leq 26$)
 $= 408$ ($26 < D_j \leq 60$),

D_j is a junction depth (nm) measured from the lower surface of the silicide layer, and T_c is a critical temperature ($^{\circ}\text{C}$) during a heat treatment.